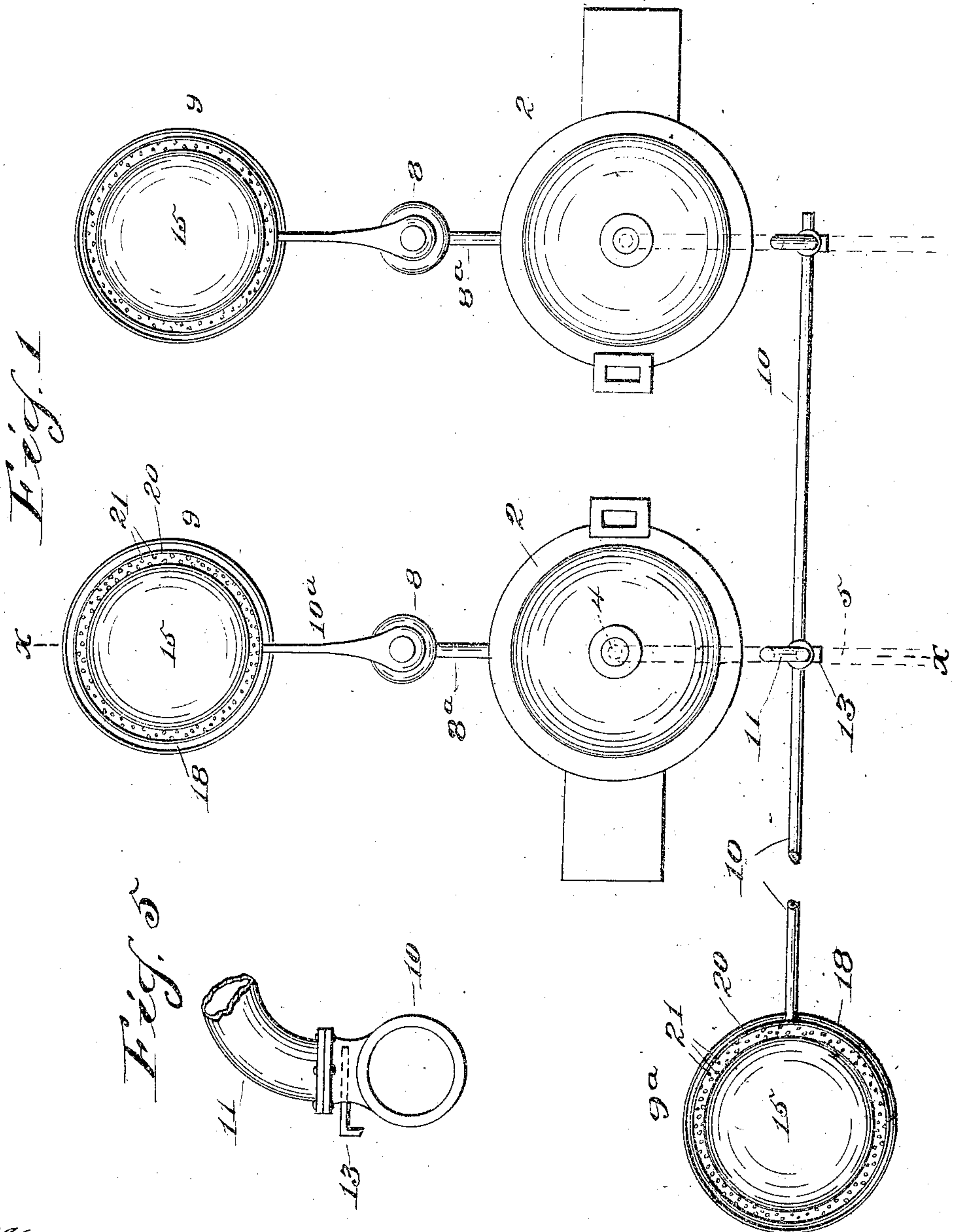


918,421.

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WOOD DISTILLING APPARATUS.  
APPLICATION FILED APR. 12, 1907.

Patented Apr. 13, 1909.  
2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

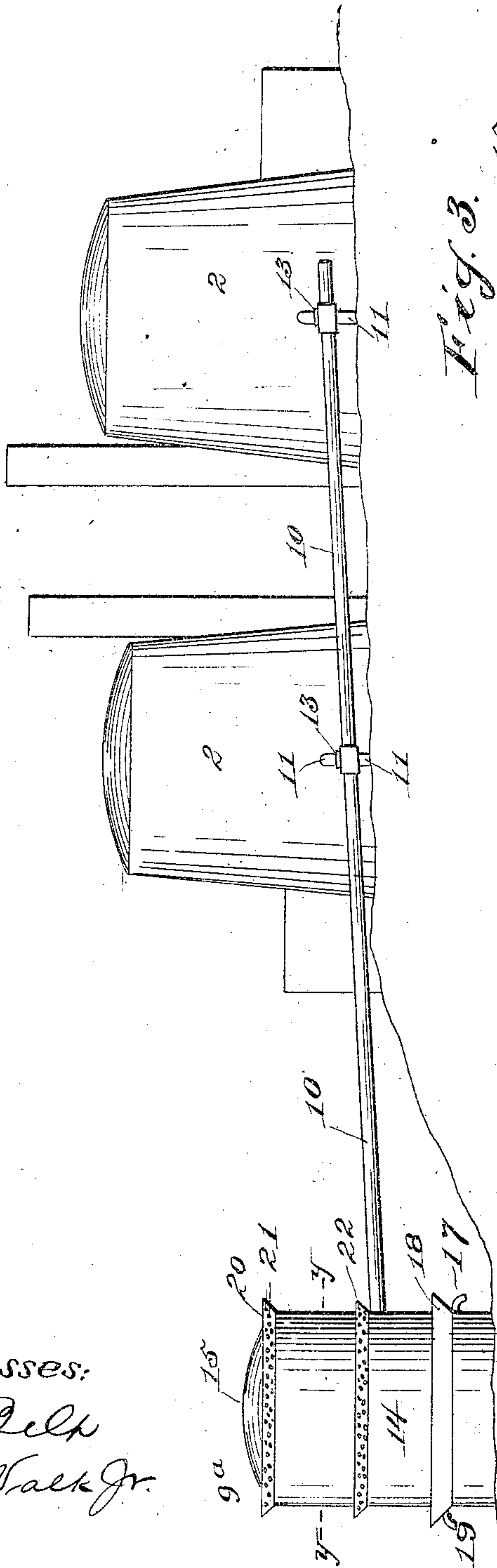


Fig. 3.

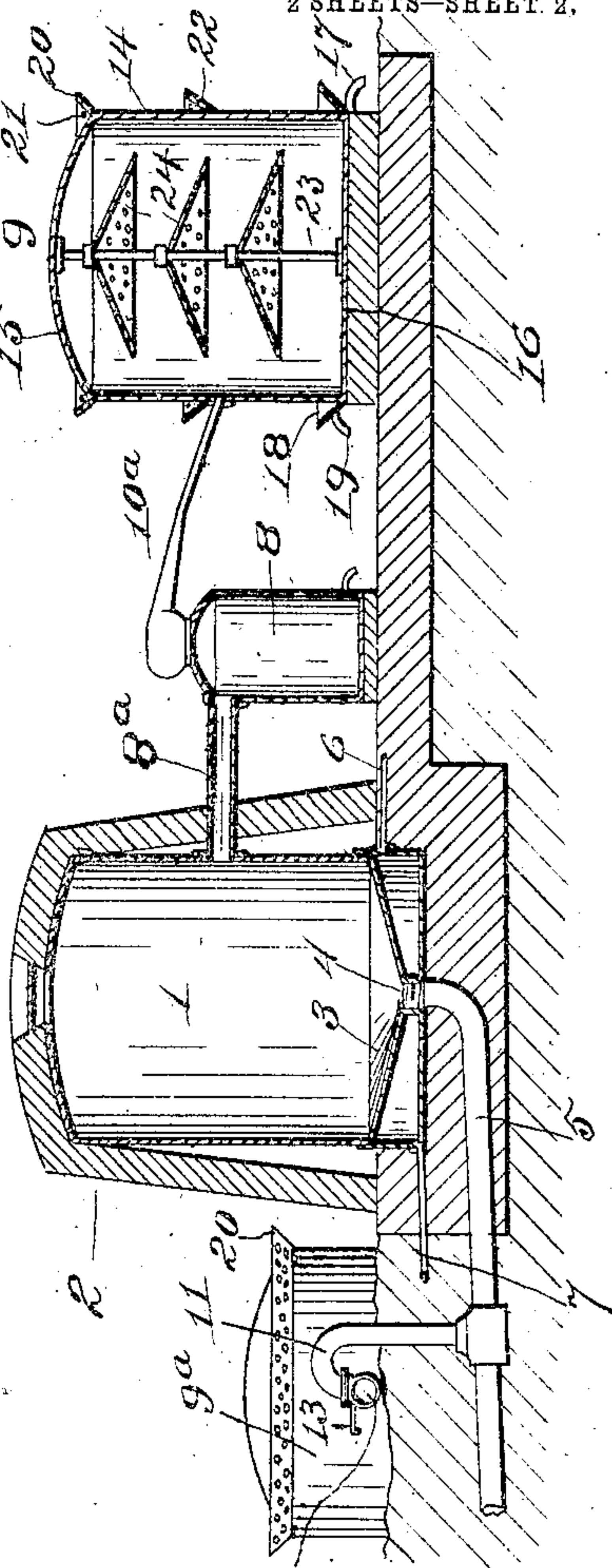
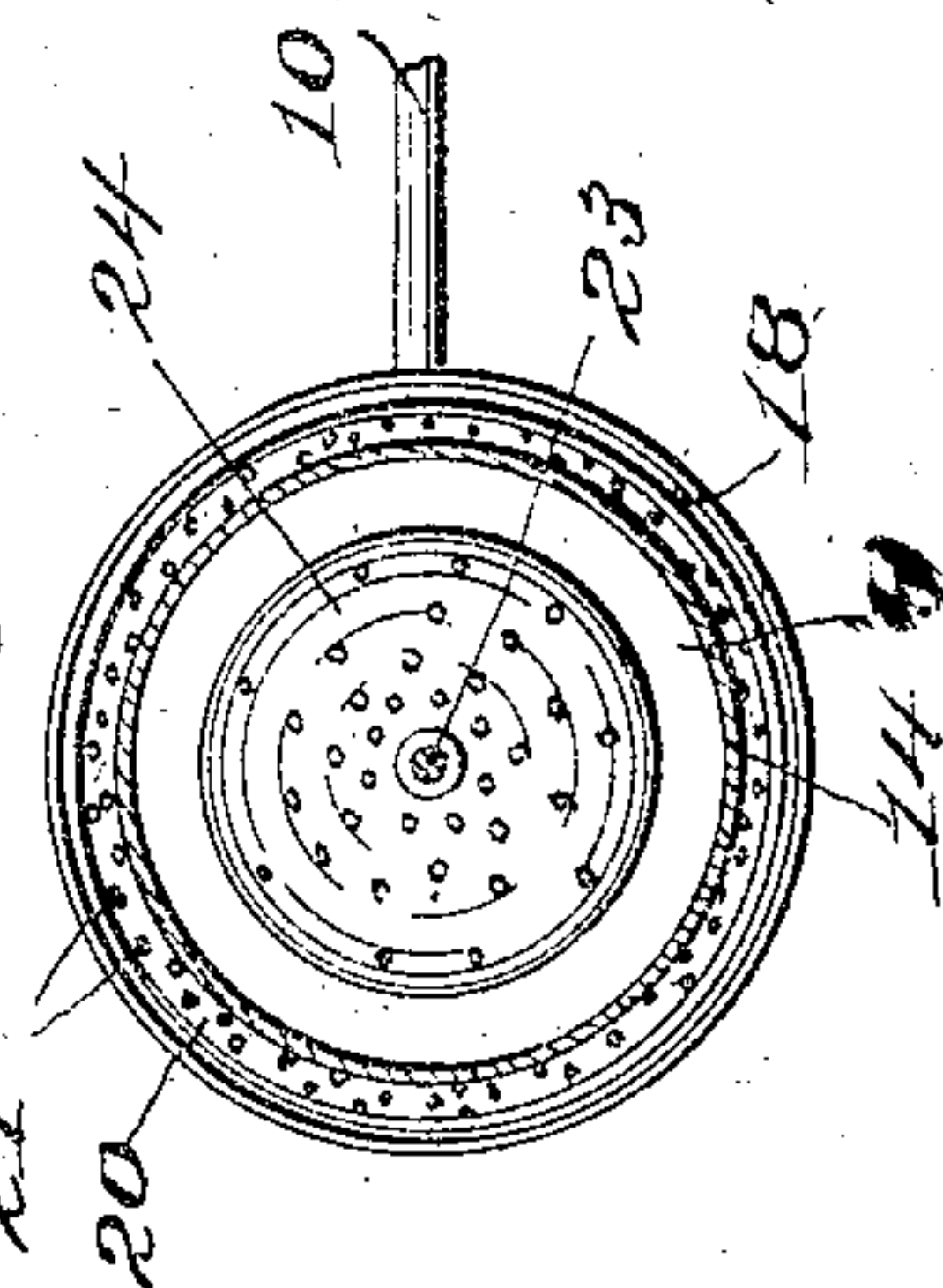


Fig. 4.



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# UNITED STATES PATENT OFFICE.

HENRY COPILOVICH, OF HINCKLEY, MINNESOTA.

## WOOD-DISTILLING APPARATUS.

No. 918,421.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed April 12, 1907. Serial No. 367,237.

*To all whom it may concern:*

Be it known that I, HENRY COPILOVICH, a citizen of the United States, residing at Hinckley, in the county of Pine and State of Minnesota, have invented certain new and useful Improvements in Wood-Distilling Apparatus, of which the following is a specification.

This invention relates to an apparatus for distilling wood and extracting tar, and pertains especially to an apparatus for removing gas or steam from the tar, and for facilitating condensation of such gas and steam.

The invention is shown in connection with my Patents No. 814,901 and No. 840,753, and while designed as an improvement thereupon, such improvement is independent of the particular invention covered by said patents; and it contemplates the provision of a simple and inexpensive apparatus, economical and certain in its operation of consuming tar-producing wood, and of producing pure unadulterated tar containing all the tar products of the consumed wood.

The object of the invention is to provide a special form of condenser to which is connected a pipe for carrying into the condenser gas and steam from the tar during or after its passage from a retort, furnace or still.

A further object of the invention is to provide a wood-still, having a tar-conveying pipe intersected by a pipe for carrying off gas and steam from the tar during its passage through said tar pipe.

It is well known that there is a certain amount of gas and steam formed or precipitated during the process of extracting tar from wood by distillation, and that such gas and steam upon condensation mix with the tar thereby injuring the latter, reducing its usefulness, and rendering it entirely useless for certain purposes.

Therefore, it is the purpose of this invention to overcome and avoid these and various other objections and disadvantages, and to furnish an apparatus wherein and whereby the tar product of wood-stills is increased and purified.

In the accompanying drawings forming part of this application:—Figure 1 is a top plan view of the invention. Fig. 2 is a side elevation. Fig. 3 is a sectional view taken on the plane indicated by the dotted line  $x-x$ , Fig. 1. Fig. 4 is a detail sectional view taken on the dotted line  $y-y$ , Fig. 2. Fig. 5 is a detail elevation showing the slide-valve.

The same reference numerals denote the same parts throughout the several views of the drawings.

Several retorts may be connected and operated together, but the two shown in the drawings will exemplify the invention. The retorts both being of the same construction only one will be hereinafter described in detail.

The retort 1 is inclosed by a furnace wall 2, and is supported by a chambered bottom 3 having a central tar discharge 4; to which is attached a pipe 5 for conveying tar from the retort. Water induction and discharge pipes 6 and 7 respectively are connected to the bottom 3 for cooling it.

The retort is connected to a condenser 8 by a pipe 8<sup>a</sup>, which conveys such elements from the body of the retort as are to be condensed. The heavier of such elements are liquefied in the condenser 8, and the lighter elements pass on into a condenser 9 (hereinafter particularly described) through a goose-neck 10<sup>a</sup> extending from the top of the condenser.

A vapor, steam or gas pipe 10 connects the tar pipes 5 of each retort with a condenser 9<sup>a</sup> (which is a duplicate of the two condensers 9) by means of vertically disposed trap pipes 11, for the purpose of carrying into one and the same condenser 9<sup>a</sup>, vapor, steam and gas from the tar during its passage through the tar pipes 5 from the retorts. The pipe 10 is thus made common to both or all retorts, and as the trap pipes 11 intersect the pipes 5 near the exit of the latter from the retorts, the vapor, gas and steam are permitted to continue with the tar during its passage through the pipe 5 beyond the trap pipes 11. At the intersection of the pipe 10 and the pipes 11, is a slide-valve 13, by which communication is opened and closed between the pipe 10 and the pipes 11.

The two condensers 9 and the condenser 9<sup>a</sup> being of the same construction, only one of them will be hereinafter described in detail. It consists of a cylindrical shell 14, having a closed dome 15, a closed bottom 16, and an outlet 17; an annular trough 18 at the bottom of the shell, and provided with an outlet 19, a top trough 20 having apertures 21, and one or more intermediate perforated troughs 22; a vertical shaft or stem 23 is mounted centrally within the shell and has secured thereto a series of perforated conical shelves or hoods 24, which are preferably of smaller diameter than the shell so



as to leave an interval or space between the periphery of the hoods and the inner wall of the shell. Water or other cooling fluid being directed upon the shell dome runs into the top trough whence it descends therethrough against the exterior of the shell to and through the intermediate trough in contact with the shell to the bottom trough. By-products of resinous wood carried into the condenser fall from one to the other of the hoods and during the water cooling of the shell are thereby condensed, so that a certain amount of turpentine is precipitated to the bottom of the shell whence it is carried off by an outlet 17. The trap pipe 11 and the pipe 10 remove from the tar pipe 5 such products of the wood as may follow with the tar into the pipe 5, so that the tar is delivered free of such products as steam, gas or vapor and in pure unadulterated condition.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:—

In a wood stilling apparatus, the combina-

tion of a plurality of retorts, a filtering condenser for each retort and connected with the body of the retorts, a filtering condenser common to all the retorts, a vapor or gas pipe upon the outside of the retorts and discharging into the said common condenser, a tar pipe for each retort and extending from the bottom thereof perpendicular to the vapor or gas pipe, a trap pipe for each retort and connecting the tar pipes with the vapor or gas pipe whereby all the retorts are connected with the common condenser, and a cut-off valve at the intersection of the vapor pipe and the tar pipes to open and close communication between the vapor pipe and the tar pipes for the purpose of operating one or more of the retorts, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY COPILOVICH.

Witnesses:

H. B. LYON,

W. H. HOBLE.